BURHANS-SHARPE PROCESS EQUIPMENT

**THE BURHANS-SHARPE COMPANY**

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Our Ref:
Q-7138

November 6, 1970

The Anaconda Company
Butte
Montana 59701

Attention: Mr. Walter Unger

Subject: Anaconda Aluminum Company
Columbia Falls
Chlorine Lancing Dust Collecting Job

Dear Mr. Unger:

We have carefully studied your chlorine lancing hold furnace dust collecting problem.

We looked at this at your suggestion of using a hot fan going directly to a 60" pressure drop venturi scrubber and venting this gas directly to the atmosphere. This would seem to be a very straightforward way of doing this; however, the fan becomes quite a problem since the gases we are handling are 500-700 deg. F, we have an elevation of 3100', and this gives us a density compared with standard air at 70 deg. F and sea level of .42. This means that in order to get 60" of pressure drop at the throat of the venturi, it is necessary to have a fan capable of over 140" at standard conditions. Looking at this from Garden City Fan & Blower possibilities, it would take three or four 40" fans in series. Each one of these 40" fans is turning at very high RPM and would take an extra large shaft and reinforced wheel. We looked into this using a Buffalo Forge fan, and here again, it would take two and very likely three of their fans in series to accomplish this job, so the fan is really quite a tough problem, and the fact that you have to elevate this pressure to this high energy level to accomplish the scrubbing of this fine particulate makes it a rather undesirable way to go, we believe.

You might wish to look at the fan on the cold side, and this presents a problem from corrosion, materials and build up, all of which are very undesirable. You might question whether you need 60" of pressure drop to accomplish this job. We can point out that work done on a rotary skim furnace at Kaiser's mill at Trentwood, Washington required 50" to come close to accomplishing the #1 Ringelman, and we believe that the particulate

coming from the chlorine lancing operation is at least as fine, if not finer, than the dust from their rotary skim furnaces. We believe further that there is a better way of doing this.

We would like you to consider the use of a hot baghouse, as shown in my sketches attached. We would like to suggest that you take your 8100 ACFM of gas, temper it with 6000 CFM of 70 deg air and come into a baghouse with 14,000 CFM of gas at 300 deg. F. The Mikro-Pulsaire baghouse would be equipped with Nomex felted bags which are suitable for 425 degrees. This baghouse must be set in a heated, thermostatically controlled building. The exact temperature required in this building would be unknown at this time, but would be adjusted to the lowest temperature where condensation does not occur in the baghouse, and where the products being collected are not allowed to become hygroscopic.

For this particular size job, we could recommend three of our square Mikro-Pulsaire baghouses, each baghouse having 100 - 8' long bags. Each baghouse would be capable of handling between 4000-5000 CFM of this gas and would remove completely the particulate from that gas stream. The gas stream leaving the baghouse then would proceed up the stack and be vented into the air. Or, if at some later date this becomes a hazard, it could be drawn into a wet scrubber and absorbed into some solution, either water or sodium hydroxide. This scrubbing tower could also be equipped with a slurry of calcium carbonate (finely divided limestone), and would react with both chlorine and HcL from the gas. This might be a cheaper scrubbing media, and we believe it would effectively buffer the action in the scrubbing tower. We strongly considered the use of calcium carbonate as an additive to our venturi scrubber, but we keep coming back to the fact that the fan problems are practically unsolvable and the power rates to operate the fans are quite high.

We would be very happy to take on the responsibility for completely designing the heated building with the three small baghouses in it and take on the engineering of adding the quenching tempering air to your gas stream such that we have a uniform 300 deg. F gas going to our baghouse collectors. We feel we could do this entire job including the engineering , erection and make this into a turnkey unit for you for under $50,000.00.

We would be very interested in working with you should you care to buy the component parts and do the engineering and installation on your own. For your information, I have estimated that the three 100S-8-20 baghouses laid down at your plant would cost $24,600.00. These units need only have the bags installed on the bag retainers and attached to the plenum. The baghouse is complete. We estimate the cost for installing the three baghouses to be $1800.00.

We have sized the fan to be a Garden City RF21 with a 100 HP open drip-proof motor. This unit laid down at your plant is approximately $2200.00 .

We would like to call your attention to the amount of material being collected as a maximum quantity as shown on the attached schematic of the baghouse. We have used 1.5 grains/cu ft and believe this is probably two to three times higher than it actually is, and come up with a collection of about 55 cu ft/day from the three baghouses, using a bulk density for this material of approximately 30#/cu ft. You can see that the material would come out of the baghouse as it dribbles through the flap valve into a pallet bin which could be removed once a day or once every other day as required by a fork truck through access doors in the rear of this building. We think this would be a very workable method of getting rid of these undesirable hygroscopic materials. The conclusions we have reached here are ones that we have been coming to over some period of time in working with Kaiser at Trentwood.

We would certainly appreciate your comments and would very much like to work with you in any way we can in solving this problem. Thank you for the courtesies which you extended to me.

Very truly yours,

THE BURHANS-SHARPE COMPANY

P. E. Sharpe

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Philip E. Sharpe
Seatttle Office

Enclosures